SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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ENGLISH AND GERMAN MINING.—No. II.

BY C. H. GUSTAVUS THOST.

Sir,—Let us now take a glance at the education of miners, whose business it is to discharge a higher duty than that of a working man. In the first place I will state how the law stands in the Kingdom of Saxony:—The Mining College at Freiberg educates young men so as to enable them to fill the offices of manager, inspector, &c., up to the chief of mining affairs in the Kingdom. Each of the five mining districts has its mining school, giving such education as is required by foremen, overlookers, underlookers, &c. A very small annual fee, ranging from 2*l.* to 3*l.*, is all that is charged for instruction, but it requires several years to complete the course of mining sciences; besides this there are certain days set apart for the pupils to visit the mines, to work there, and to be guided and instructed by appointed persons. The system of yearly public examination is adopted. The pupil has, previously to his entering the college or the school, to receive practical instruction in a mine. At the end of the course, which lasts in the college education for four successive years, the pupil has to enter upon a thorough practical course, commencing with the hammer and jumper. Notes are kept against him, and he has to make his regular reports to the mining board. After having finished that practical course, the student becomes candidate, in which qualification he is subjected to similar superintendence, and is obliged to work in any branch of mining operations which the board may order. Finally, he has a chance of obtaining a situation, and of being promoted according to seniority and capacity. Foreigners pay a higher fee than natives for admission to the lectures, and, if they choose to do so, can subject themselves to the same superintendence as natives, or, if they prefer it, may be under no control whatever. To point out one detail I shall mention the lectures upon general mining operations. They occupy two years, being given during five hours in the week for about nine months in each year, so that about 360 lectures are delivered.

This, undoubtedly, appears to afford excellent opportunities for young men to follow a complete course of study, and to obtain a fair amount of knowledge, with tolerable practical experience, useful in his future employment. Great liberality, care, and kindness is shown to them as well as to the foreigners everywhere, when visiting mines or seeking information. Indeed, this liberality is perhaps carried too far, and thus it is not always adequately appreciated by the young people. As the college and schools are situate in the middle of the mining districts, every facility is offered for combining theoretical study with practical life, both of which items—whatever others may think to the contrary—are fundamental necessities for making a man a miner in the higher sense of the word. The standard of the working miner's education is that which generally characterises the degree of the other working men of the country, or near about it. Indeed, much more is not absolutely required of them.

I will now enquire—Is an English mining captain to be considered superior to a German one? I believe that, as to scientific acquirements, the German must be named first, but it must be added against him, that he is not allowed to develope all his knowledge in his individual situation, because every branch and subdivision of branches with their respective narrow scope has again an official to attend in his own sphere, besides which a German captain must rather do what he is ordered to do. Thus a German may, in time, gather in his own sphere the most minute practical knowledge, whilst many other special branches are not within his range. In British mining a captain has a larger field of action, so many officials and subofficials being very properly dispensed with. Thus an English captain, after several years of employment, obtains more practical tact than the narrow compass of the German law admits of. I believe that an Englishman availing himself of at least two years study at Freiberg, for instance, would afterwards become in this free country a more thorough miner than a German can become in his restricted country. That appears to me to be the reason that Germans generally are considered as philosophical, theoretical, and unpractical people, and that everyone in his narrow sphere of activity is sometimes induced to search too minutely after things which might as well be left unsearched for, although, in many instances, happy results are produced.

In Britain the Mining School in Jermyn-street certainly appears calculated to do a vast deal of good to mining, but there is not sufficient variety in the lectures, and it is unfortunate that it should be situate in the midst of a great, commercial, and rich city, instead of in the middle of a mining district. But London insists upon having everything concentrated within its huge greatness, allowing no share to other towns in the country. A mining student should live and study where every man lives and thinks of nothing but mining, which certainly is of great educational influence upon young people, by absorbing their thoughts in the strata of mining science. In this respect it is probable that no better place for a mining school could be pointed out than the mining district in the principality of Wales.

Having now sketched the inner machinery of mining, let us take a glance at the outside of the mines in this and the other country, and we at once perceive the greatest difference between them—the difference of capital. The wealth of Britain is the leader; every undertaking can be speedily carried to its proper extent and end, whilst in Germany, although longer periods of time will be required, by means of slow and moderate calls, the same end will be arrived at, and perhaps with greater safety. Therefore we see in Britain each mine worked with a sudden and large capital, because the lifetime of a mine is a short lease, whilst the lifetime of a German mine an unlimited lease. We see here the machinery in fine and grand style, good—nay, even splendid—houses and offices erected in the shortest possible time. Now almost the reverse can only be expected in Germany, where there are not so many rich, but also not so many poor people. Take a shareholder possessing 1-128th of a mine, and paying for 15 or 20 years his annual call of 8s. or 12s., and then receiving an equal yearly amount as returns! The great wealth of this country induces even the poorer class to endeavour to take the shortest road to riches which are ever before their eyes, while in Germany a poor man tries to rise by continued industry and by degrees. This influences the labourer to diligence and economy to a far greater extent than in England, where he works, if he has by chance or contrivance a good bargain, with all his might, in this instance outdoing the German miner, to whom such chances are not offered, and who has no choice but to work every day alike, whilst the English miner would rather like to suspend working and wait a more favourable chance. As to the performance of mining operations, I am of opinion that greater economy is exhibited in Germany than in Britain. I would therefore advise that when criticising German mining all that I have said and even more should be taken into account. But it would be unjust to say no good can come out of Germany.

Briefly reviewing, in conclusion, the general principles of mining in Britain and in Germany, I arrive at this:—If British mining, coal and mineral, were, by liberal laws consistent with the British constitution, placed under the superintendence of a general board of inspection; if each mine were bound by law to be managed by a man or men who had passed a public examination as to theoretical and practical capabilities; if each mine had to draw up a yearly technical report for that board of inspection; if, in short, mining were acknowledged as a national-economical business and treated accordingly, then British mining would be perfect. As to German mining affairs, to render them perfect, a change throughout would be requisite, indeed a change upwards to their very politically narrow-minded, if not arbitrary, institutions.—*Tyndrum, Crieff, N. B.*

ROCKS AND METAL DEPOSITS OF NAMAQUALAND.—No. VI.

I have already mentioned that granites, and all rocks of the lowest degree of exfoliation, are much less conspicuous in Northern than they are in Southern Namaqualand. The principal variety of granite—that which forms the most bulky masses—is a kind of felspathic (porphyritic) granite, with its component felspar crystals of a reddish or light brown red colour, its other component parts being quartz and horneblende, or traces of mica. This granite forms not only mountain ranges of considerable bulk (*e.g.*, the mountain range to the south-south-west, near Kabous missionary station), but it is traceable on the bottom of valleys, and on the lower ground in general, over great tracts of the country; and it is not only [illegible] to occur to the westward of those mountains which form and mark out the principal edges of the great steppes of the country, but also forming mountains and the base of valleys to the eastward of them, on the higher level; and it may hence be inferred that this rock forms the base-rock of the country, just as a similar rock forms the base of the country in the southern part of the colony, from Cape Town northward; the only difference between the two being in the colour of the felspar—reddish in the northern, white albite in the western part of the colony. The mountain masses formed by this rock may easily be recognised from considerable distance by their right-angular, tower or castle-like appearance; and I found that any fragment of the same rock could be used almost as an exact representation of the larger mountain masses—the respective crystals of felspar representing, as it were, the large rectangular, perpendicular masses of rock of the very mountain range, most strikingly illustrating the great influence which the arrangement and shape of the components of a rock exercise upon the surface shape of mountains which are formed of that rock. In describing that mountain range near Kabous which I have alluded to, I shall have an opportunity to mention the principal peculiarities which are observable in that rock. This mountain range, with its towering rectangular rocks, marks out the northern edge of a run of plateaus, which is situated to the south from these, and the ground is falling or sloping gradually down from the north side of that mountain range towards the Orange River. The steeper part of that slope, commencing immediately from the foot of those towering masses of rock, is covered by a decomposed crust of the same rock, the mass of which shows distinctly all the components of that rock, but of a very loose coherence, so that they could be crumbled to pieces by a squeeze with the fingers. This part is intersected by numerous ravines, which have been formed by the periodical streams of water. This decomposed portion appears to extend in its thickness only through a few horizontal divisional fissures of the rock, the firm, solid rock appearing again on the surface near to and in the larger and deeper fissures (valleys), and its mineral segregations are not vein-like, but occur (as in every rock where the contact of magnetic tendency was overpowered by local agencies—see below) in irregular, sometimes small seams, or bed rocks, sometimes nodular masses; numerous nodular and irregularly shaped aggregations of hornblende, quartzose, &c., particles are met with in those fissures and on the bottoms of valleys.

I met with several small veins of epidote in the firm, solid portion of that rock (which, as stated, shows itself on the surface near to and on the bottoms of valleys). The peculiar formation of quartz veins in the cleavage fissures of that rock (especially on spots where it is water-worn) I alluded to above. That "silicification" in the cleavage fissures of the rock appears, however, in other spots not to have been going on so regularly as in the instance to which I alluded above; for I met with several instances, especially in Kloof, in and near the foot of the above-mentioned mountain range, where not only the cleavage fissures were more impregnated, or rather lined, with quartz, but where the whole mass of the rock, on either side of the respective cleavage fissures, was highly silicified, in irregular and varying breadth, the cleavage fissures being in that case obliterated, so that their position could only be identified by careful comparison with those portions of the same rock in the vicinity where they were distinctly traceable. The more silicious portions of the rock being now less affected by the atmospheric and aqueous decomposing agents than the remaining more felspathic portion, it remained standing in relief as it were (like the straight-lined bands in the cleavage planes above alluded to), when the other component of the rock was gradually more and more worn away; and in this manner there were created on the flat surface of the rock, generally gently sloping, numerous more or less annular and shallow basin-like cavities, so numerous in many instances that the respective rock, especially if seen from some distance off, presented in its appearance a great resemblance to a honeycomb.

It is but natural that whenever in this porphyritic syenite such segregations of the silicious component occurred, they would tend to produce corresponding segregations of felspathic and hornblendic components, and we notice, hence, in the same same locality, numerous veins and veinlets of greenstone, on the northern slope of that mountain range, traversing the syenite, the latter being often highly silicious when in contact with such veins.

I noticed on one spot veins of greenstone traversing syenite, and not far from it, on another spot, veins of syenite traversing greenstone; and in the disposition and mutual position of such veins the same causes appear to have exercised a prevalent influence, which has controlled the formation of the cleavage fissures. Wherever we can obtain a glimpse at a vertical section of such rock, it is noticed that perpendicular as well as horizontal veins of such rock occur in the same mass, and the hypothesis that they were impelled from above would be as strongly supported by the appearance of these veins, as the hypothesis which assumes that they were forced up from below; the truth, perhaps, being that they are the results of the change which is gradually going on in the internal arrangement of the rock, the previous creation of cleavage fissures being, most likely, an essential condition of their formation, and exercising a powerful influence upon their shape. I could invariably trace on the sides of such veins the perfectly smooth, straight lines that correspond with the main cleavages of the surrounding rock, the veins themselves showing even, in very numerous cases, the perfect angles of such cleavage fissures. The shape of those veins being roundish only, and according to my experience exclusively there, when the surrounding rock was highly silicified, thus proving the contemporaneous occurrence of both phenomena.

The famous veins of granite in the silicious clay-slate on the north side of Table Mountain present precisely similar appearance—that is, sharp, well-defined angles, and smooth, straight sides, which correspond with the cleavage fissures of both the granite and the clay-slate; and it would be hardly fair to suppose that the granite, when in a hot fluid state, should have respected the cleavage planes of the slate so much as not to make the least impression upon them; not to mention the great difficulty to account by such a hypothesis for the occurrence of fragments of granite (often of a perfectly regular parallelipipedal shape) inclosed within the very mass of the clay-slate.

In most of the diagrams which were intended to represent such veins, I noticed that these many sharp angles and smooth, straight sides of the veins were left out, although those, and many other minute and apparently insignificant features are as important and essential for the purpose of leading to a satisfactory general conclusion, as the many small and insignificant springs are for the formation of rivers and large streams.

I certainly think that the matter is well deserving of the most careful attention and unbiassed examination from the hands of able and experienced practical geologists, before the above hypothesis, of the igneous origin of veins, is taken as a firmly established dogma. JULIUS.

IRON MANUFACTURE—DRY PUDDLING v. PIG-BOILING.

"THE CORT CASE."

Sir,—I have been too much engaged for some months to pay any effectual attention to the progress of this case; in fact, since my letters in the *Times* last autumn led Lord Palmerston, with his usual tact and sagacity, to solve a difficulty by the grant of a pension to Mr. Richard Cort, little has been done but to fritter away, by mistakes, perversions, and concealments, the magnificent position in which the claims of the Cort family were placed by the masterly review and extracts in the *Times* of July 29, 1856, of the petition I prepared for the Legislature. I have, of course, suffered some annoyance at witnessing so great a case sinking gradually away, from shock after shock administered by the consummate folly, ignorance, and conceit of its would-be advocates. The final blow to its success with the iron trade was struck by the absurd attack in the *Mechanics' Magazine*, on the inventor of the pig-boiling process—an attack on which I expressed to you my opinion the moment it appeared. I can only rightly characterise this attack, by saying that it was quite worthy in matter and spirit of "W.," "Spectator," and other scribes, who, when out-argued and out-facted upon physical truths by Mr. Hopkins, in the projectile controversy, took refuge in personal abuse, and are now, I see, increasing their reputation by pelting Faraday.

Improvements in the manufacture of iron are far too weighty, and involve too much solid and enduring fact, to be capable of being handled by ignoramuses and sciolists. The subject is very comprehensive as well as substantial, and the slight missives of editorial impertinence glance from the massive reality like an arrow from a tower.

The abridgments of iron patents lately published by Mr. Bennet Woodcroft, have made some extraordinary revelations.* The publication of Cort's specification, some months since, had corrected the error into which his family had fallen, of representing the puddling process as the first patent of 1783. The rollers were the patent of 1783, and the puddling the patent of 1784, by which correction Peter Onions takes precedence of Cort, as using the reverbatory in the decarbonisation of iron. I do not attach much importance to this precedence; the use of the blast under the grate, and the use of streams of blast upon the iron, are very like variations of the Cort process, upon which experimenting had been going forward a long time before the date of the patent, in 1784; and even if the plan of Onions were his own idea, the greater simplicity of the Cort process clearly makes a valid patent claim. But the patent which extinguishes the originality of the Cort invention, as an idea, is that of Thomas and George Cranage, in 1766, claiming to make pig-iron malleable in a reverbatory furnace with raw pit coal only, whence it is taken to the forge hammer, and drawn into bars of various shapes and sizes, according to the will of the workman." This indicates beyond any question the same process which Cort afterwards brought into use. It is not only possible, but most probable, that Cort knew nothing of this patent. The determined and masterly practical mind evinced in his specifications, and borne witness to by his contemporaries, had been for years engaged in persevering experiments with air furnaces; and the original discovery of the malleabilisation of pig-iron, by long exposure, may very well be a likely result of such experiments. But there is a still earlier claim for making iron with pit coal in an air furnace, by William Wood, A.D. 1728. As there is no specification, I notice this patent only because it proposes to do what Cort effected sixty years afterwards, "to supply the nation with all the iron it requires, and prevent the buying of iron from foreign parts, which amounts to about 20,000 tons yearly, and is mostly paid for in ready money, to our great disadvantage and loss." Every one at all acquainted with patents, knows that the mere invention or conception requires not one hundredth part the ability and labour which must be bestowed before realising it. This record is, therefore, interesting, and it exhibits that Cort's energies supplied a desideratum of sixty years' growth, during which time we also learn from the record that the importation of foreign iron had nearly trebled. Was this the same Wood whose copper coinage is immortalised in Dean Swift's prose?

To what degree of perfection Cort might eventually have brought his puddling process is a blank in history. The whole of the comprehensive methods of making wrought iron on a large scale, which contrast in his specifications with the petty contrivances then in use, were transplanted to Wales, and he was then crushed by the most fearful iniquity which a Government ever afforded as the recompense and encouragement of inventions. Lord Bacon has told us, that noble inventions hold the most excellent place among human actions; because the civil benefits of statesmen are of partial locality, and descend, at the most, only to a few ages; whereas, inventions are perpetuated through the course of time, and extend to all mankind. And as in his comparison he proceeds to give a further precedence to inventions over civil reforms, because they spread their advantages without force or perturbation, so the corrupt patrons of Henry Cort took pains to violate this law also, and installed the success of his inventions by the disturbance of a human sacrifice.

The ignorance and absurdity of the unfortunate attempts which have been made in numerous publications, besides the *Mechanics' Magazine*, to claim for Henry Cort the invention and practice of the pig-boiling process, pass all understanding. Those who make them, whether journalists or others, ought, if they really desire the inventor's family to obtain a public recompense, as a rational atonement for grievous public crimes perpetrated against a national benefactor, to be careful that they advance only

* *Inter alia*, I perceive Mr. Anthony Hill, 1817, has actually a patent for the Bessemer *cullender!* He must have smiled much at last year's great novelty.

what can be supported. This case is no personal question whatever of any individual—it is the claim of a whole family to the consideration of Parliament which is at stake, a vindication of the national honour upon great and comprehensive grounds. Such a case can only be sustained by competent persons, and it can only be grievously damaged by the petty squabbles of ignorance.

The state to which Cort had brought the operation of malleabilising iron in an air furnace, at the date when his property was plundered and handed over to a Government clerk was this:—He had, in 1785, with the aid of his patent rollers and welding furnaces, manufactured by puddling 60 tons of cast ballast into 30 tons of tough fibrous iron, which, under the highest scientific authority, was successfully tested against the best foreign iron. The question which then engaged his attention, as may be seen in the correspondence with Dr. Black's brother, was to reduce the waste and cost of the conversion. Cort expresses his conviction of success in so cheapening the cost of manufacture; this is shown to have very much diminished in February, 1789, when Sir Jeremiah Homfray gives the actual results of the commencement of operations in puddling pig-iron at Pennydarran. During that year the process of puddling pig was sufficiently successful in the Welsh hands to enable them to supply the Government contracts. This official fact cannot be disputed. That considerable difficulties and drawbacks must have existed in puddling pig-iron upon sand bottoms, is a matter of course, and they led to the introduction at Pennydarran of the running out the fire to prepare the pig, so as to shorten the puddling process, upon the prejudicial sand bottoms. There are men yet living who recollect the circumstance of the patterns of a running-out fire being first brought from Staffordshire to Pennydarran. In the charcoal running-out fire, it was necessary to run out the metal two or three times before it was sufficiently decarbonised for finally sinking in the hollow fire; but the greater heat of the running-out fire, when supplied with coke and a stronger blast, enabled the pig to be prepared for the puddling furnace at one operation.

That the refinery was an improvement on the process which Cort was, as far as we know, practising at the moment he was brutally cut down, no informed person will deny. A laborious and expensive operation would have been gratuitously superadded, and, in the first instance, introduced into Wales. It was, however, a modification comprised in Cort's patent, for he claims the use of all cast metal; and the use which was made of this modification in the Committee of 1812, to deprive the children of the inventor of the grooved rollers, and of the other arrangements specified for the more effectual manufacture of iron on a large scale, of any recompense, was entirely worthy of the crimes of the Navy Pay Office of 1789, which it was the interest and the object of the Navy Pay Office of 1812 to keep shrouded in the obscurity of the slumber then enveloping them.

The refinery continued, and was considered an indispensable adjunct to the puddling of iron, until the invention of the pig-boiling process. The ignorance which has prevailed, and generally prevails, on the invention and author of a process which has by degrees nearly extinguished the refinery fires, cannot be called extraordinary, because it seems the fate destined to attach to improvements in iron making. There is no manufacture, perhaps, which comes so little within the ordinary chatter and routine of book-making and periodical spouting; indeed, the facts in ironmaking seem to have a weight which makes them difficult of transport, even from one iron district to another. I have known numerous instances of Wales being in entire ignorance of what Staffordshire was doing, and Staffordshire equally ignorant of the acts of Wales; and from such causes as these it has arisen, that authorities, expected to be best informed on everything relating to iron—such as even Mr. Fairbairn, were not aware how so great an improvement as the direct manufacture of iron of the first quality, at one process, from the pig, without the intervention of the refinery, came to be established in this country.

I have for ten years been seeking for *exact* information as to the origin except in [illegible], but I have enquired in vain, it would appear, everywhere Cort's claim, and [illegible] quarter. The perseverance with which I agitated the unredeemed promises, at last shook up to the public surface, in Bessemer's 1856, the true inventor of pig-boiling, and of the means for rendering it possible. I was much struck, on various grounds, with the letter which appeared at that time in the *Birmingham Journal*, from Mr. Hall, of the Bloomfield Works, claiming the invention of pig-boiling, and I have noticed it more than once in your pages. That letter has been the means of supplying the information I had so long searched for, and a vast deal more. I shall have a great deal to say on the subject, when time has permitted me to completely master it; for there is nothing of greater importance than to give public record to the gigantic value of the very few real stages which have been made in substantially facilitating the progress in quality as well as quantity in manufacturing that metal, which is the all in all of civilisation; but at present I am only directing attention to explain the hurtful absurdity of interpreting the word "ebullition," or ferment, whether read in the patents of Cort, Onions, or any one else, "the pig-boiling process." There is no truer way of reaching a clear conclusion what a thing is, than by determining what it is not. The real value of what actually belongs to Cort is only deteriorated by comprising it with matters to which he has no claim.

In the practice of the original process of puddling, it was an object to avoid exposing the metal to too intense a heat, to save waste both of the iron and of the furnace. When iron bottoms were introduced, one material element of deterioration was removed; but the puddling was still necessarily continued at the lowest available temperature. That intense liquefaction, which permits the iron, protected in a bath of cinder, to throw up, by their lighter specific gravity, all the impure compounds, was inadmissible in exposed puddling; and to shorten the time of exposure, various means, especially the use of water, were employed to hasten the decarbonisation, thus hastening the malleabilisation of the heat, by checking the escape of pernicious alloys, and prematurely bringing the mass to the hammer or the rolls, with all the confined impurities which the metal took with it into the puddling furnace, or contracted while it was there.

The "bringing the iron into nature" under a bath of liquid cinder, was the well known practice of the charcoal hollow fire; and I have been told by persons of veracity, that they conceived the idea of puddling in a similar manner, with the aid of iron lining to the puddling furnace, very early in the present century. With the original puddling furnace, as used with sand bottoms, the thing was so totally impracticable, as in itself to render absurd the assertion that Henry Cort had practised it. Iron bottoms, after a long opposition, as is usual with everything new that is good, were at length introduced; but I can hear no intelligence of any person having actually attempted to puddle in cinder, until Mr. Hall's attention was directed to its benefits, by the singular experiment with bosh cinder, related in the letter to the *Birmingham Journal*. This first hint of puddle boiling led to the conceptions which he has since realised, but the iron-bottom merely was found quite insufficient for the intense action excited in the process; the sides of the furnaces were rapidly destroyed by the heaving and boiling mass, and it was not until after years of toil and thought, in constructing a proper furnace, with iron sides as well as bottom, and discovering a proper lining for their interior, that Mr. Hall realized his idea, and succeeded in manufacturing economically direct from the pig, without the intervention of the refinery, qualities of iron far superior to any that it is possible to puddle from the finest metal. The perfect liquefaction of the iron under the protection of the cinder, which retards decarbonisation, and prevents oxidation, gives the metal time to clear itself of the lighter impurities, which are thrown up like a scum, as in any other kind of boiling, and carried away in the cinder. A perfect command is attained of all the physical elements of the operation; there is no limit to the heat which may be applied; and Mr. Hall's practice entirely reversed the prevailing theory, that the best bar-iron must be always produced at the lowest temperature. This theory has had its rise in the fact that the manufacture by any exposed process renders the metal liable to be alloyed with its own oxide, exactly in proportion to the heat applied; by reversing the fact, and protecting the iron from that very dangerous contingency, the theory is reversed.

The scribes who have so numerously attempted to claim for Henry Cort the invention of the pig-boiling process, because his specification mentions the ebullition which takes place whenever pig-iron is melted at a sufficient heat, ought to have looked a little into the facts, and before they wrote obtained some practical data; they would then have avoided inflicting so serious an injury as they have done on the cause they professed to advocate. I say professed, because the simultaneous attack made on Mr. Hall, already one of the subscribers to the Cort fund, were so singular and personal in their character, as to tempt one to say, "an enemy has done this." To attack a friend is at any time a delicate and difficult navigation, when there are the best reasons of truth and duty to command steering in the hazardous course; but when the attackee is entirely in the right, and the attackers entirely in the wrong, the movement resembles something more than ignorance, leading to the suspicion that wolves in sheeps' clothing have leaped into the fold, to decoy incompetence by traitorous advice, and under the mask of advocacy strip the claims of the Cort family of that high honour which has hitherto been their due.

The monumental record owing by this nation to Henry Cort's real merits must not be sacrificed to the verbal quibbles of the ill-intentioned or the ill-informed. Mr. Woodcroft's book shows he was not the first originator of the *idea* of puddling, neither was he the inventor of Mr. Hall's inventions of pig-boiling and the boiling furnace, a grand stage in the manufacture of iron, because supplying the means of manufacturing with *certainty*, and with *economy*, *by one process*, the produce of the blast-furnace directly into malleable iron of the highest quality, a simplicity and saving which *did not exist* in practice before his time. I say it supplies the *means* of making iron of the highest quality, because those manufacturers who study quantity more than quality do not take the pains to develope its full powers, and from their imperfect adoption of it the impression which very much prevails has been acquired, that pig-boiling is only a rough means of getting at bar-iron of indifferent quality at a cheap cost. This is its *abuse*; its *use* is patent to all who know the Bloomfield iron. But though Cort was not, as is now shown, the first to *conceive* the *idea* of puddling, he was the first to supersede foreign iron by the *practice* of it; he *introduced it practically* as the grand basis of any subsequent improvement. He also, whatever might have been the forgotten object of the notches or furrows in Payne's rollers, was the first to roll bar-iron round, square, or taper, as a marketable article, by grooved rollers. He was the first to divert the balling furnace from its petty practice of welding little balls of scrap iron in pots, or on fire tiles, to its present use of heating and welding large piles of iron, through the grooved rollers of his own invention. He was the first to claim and show the way, by all his combined practical methods, to manufacture bar-iron on a large scale "by a more effectual application of fire and machinery, as described, than was before known or used by others, and entirely new and contrary to all received opinions amongst persons conversant in the manufacture of iron." These are his claims; they were not disputed by his contemporaries, who, on the contrary, rushed to obtain the use of the beneficial novelties by the payment of large royalties, from 10s. to 20s. per ton. From that date the manufacture and the superiority of British iron commenced, and has steadily progressed, "by his effectual applications of fire and machinery," to its present gigantic extent.

These are the broad facts on which the Cort appeal to the nation rests, an appeal not in favour of one person only, but of many deserving persons, some of whom have not had even the pensionary fragment of acknowledgement. These are Cort's merits, and they would have earned their own recompense but for those acts of desperate official ignominy, which augment a thousandfold the claims of his descendants upon the nation for *justice*, even much more than for reward. Let those who would advocate the cause of this family avoid all errors, and endeavour to "rise to the height of this great argument."—*May* 4. DAVID MUSHET.

ON THE EMPLOYMENT OF CAPITAL IN IRONWORKS AND COLLIERIES.

We last week noticed Mr. Wilkie's excellent treatise on the Manufacture of Iron in Great Britain, calling especial attention to his remarks on the employment of capital in ironworks and collieries; and we now return to the subject, to lay his views more fully before our readers. The importance of the British iron manufacture [illegible] the opportunities it affords for the employment of capital, are so great [illegible] money so frequently embarked in it by parties who are personally wholly unacquainted with this branch of our national industry, that an endeavour to point out some of the principal causes which lead to such frequent failures [illegible] must be interesting, and may prove useful. The principal branches, commercially speaking, into which the iron manufacture is divided may be thus enumerated:—Smelting pig iron from the ore, manufacturing the pig or cast-iron into wrought-iron—bars, rods, sheets, &c., which is done at the forge, and casting the pig-iron into general use, which is done at the foundry.

Where the smelting of iron is carried on, the manufacturer generally raises his own coal, ironstone, and sometimes limestone, and makes his own coke, firebrick, &c., and then sells his pig-iron to the forge and mill, or foundry proprietor, or converts it himself into wrought-iron or foundry goods. Forge and mill proprietors and ironfounders usually purchase the pig-iron and coal they require from other parties, and make their profit by converting the pig-iron into marketable articles. Of course by this method of procedure works may be undertaken with a smaller amount of capital than would be needful in the case of opening up minerals, but there is also less opportunity of making large profits, as when iron rises in value the prices of all the necessary materials rise also, and when iron is low, although the price of materials would likewise fall, still a profit would be made upon them by the seller. In case of works raising the mineral for themselves, supposing, of course, that they are of suitable quality and worked at a moderate cost, there is no intervening profit, and when iron is high in price the profits are very great, and even when iron is low, it is still made at the minimum of expense, all the materials being procured at cost price.

There are two main causes of want of success in establishing profitable iron works—injudicious selection of site as affecting carriage, quality of minerals, royalty, &c.; and want of judgment in carrying out works even when the situation, quality of coal and other minerals, facilities of carriage, and arrangements as to royalties, &c., are of a favourable character. The conditions necessary to be borne in mind in selecting a spot for establishing smelting works, and indeed in some degree any other branch of iron manufacture, are the possession of suitable coal, and which can be worked at a moderate cost, ironstone of moderate quality, facilities for carriage both for sending the manufactured iron to market, and for importing ironstone, firebrick, timber and general stores, when required. The minerals must not only be of suitable quality, but their extent must be ascertained, as also their depth from surface, their dip, freedom from faults, dislocations and disturbances, as a great dip causes incalculably more trouble and expense in working, than when the strata are nearly horizontal, and a fault is often the cause of a complete change in the position and consequent value of the minerals. The royalty, or "galeage," to be paid for permission to work (a very usual royalty is 6d. per ton), and the terms of the lease as relates to dead rent (or payment in case the royalty does not amount to a certain sum per annum) reasonable. Proper provision should also be made for the lessee to surrender his lease if he should find it necessary to do so. There must also be a good supply of water available; the lease should include permission to use, on easy terms, any stone, clay, sand, or other materials that may be useful in carrying out the works; and the terms for damage done to the surface in erecting works, making roads, tramways, water-courses, reservoirs, &c., and depositing cinder and other refuse, should be clearly defined. Right of way, especially if it should be necessary to bring any material from adjoining or neighbouring properties, should have full consideration, so as to prevent any cause of difference or undue expense on this point.

A statement that is often put forth as an inducement to capitalists to enter upon working minerals is, that they "crop out" on the side of a hill, and can consequently be obtained without the expense of sinking a pit, and that in many cases the water will run out from the level, and thus save the expense of pumping it. Now such statements must be received with great caution for several reasons, for although it is true that the position and inclination of the minerals may, in some instances, be such as to present great advantages for working, in the generality of cases the advantages are not so real as first appearances may indicate, and serious drawbacks may also have to be encountered. One of the chief disadvantages to be encountered in working minerals by "level" is deficient ventilation, and where underground workings are badly ventilated, nothing goes on right. The usual reason of this deficient ventilation is, that there is no opportunity of obtaining a vertical shaft to act as a chimney, the expense of making an air-shaft from the summit of the hill where the elevation was considerable, frequently being the obstacle, and if made, the position is much the same as a colliery won by pits. Another great disadvantage is, that when a drift has been extended a considerable distance into the side of the mountain, and the mineral accessible by it is worked out, whenever a further extension of the drift is made and fresh mineral obtained, it frequently has to be brought out through the first level, heavy expense being incurred in maintaining the drift; the cost of haulage, especially when the distance amounts to a mile or upwards, is a serious matter, and the ventilation being very feeble, only a small force of colliers can be put on, and thus the output of coal will be proportionately small, or supposing the air to be sufficient for a large number of men there would be no advantage in employing them, as the distance would preclude the delivery of any large quantity of mineral at the level's mouth, and the coal could not be removed from the workings as fast as loaded. The output of coal from a level is considered good if it amounts to 60 or 80 tons a day, and is frequently only 40 or 50 tons, whilst a pit will turn out easily from a single shaft 300 tons per day, and double that quantity if required in a day of 12 hours, and the whole being delivered at one spot, no haulage for the purpose of concentrating such a quantity of mineral is required, as would be the case where the same quantity of coal has to be procured from a number of levels.

Iron and coal companies on the Joint-Stock System are usually projected by parties who, either as landowners or in some other way, have interests in the affair totally separate and distinct from those of the body of shareholders. Doing business for the sake of doing business is a course of procedure which should be avoided, nothing is to be got by it, and without there is a profit to be obtained business had better not be undertaken. In a concern where the outlay of money has been judiciously made, the amount sunk in works and appliances has been kept in due proportion, and the current expenses economically arranged, there is the power not only to bear with comparative ease the pressure of adverse times (which are sure to occur, and frequently with little notice of their advent), but, to a great extent to admit of declining or making contracts, sales, or other undertakings; whereas in a concern with little or no available capital, and burdened with current expenses of works too large for the monetary resources, no option is left at a time of depression but either close at once and stop further loss, or, what is frequently done, accept any contracts that can be procured, whether profitable or not, and endeavour by all sorts of manœuvering to keep things together, with the too often delusive hope that some happy turn may arise to enable escape from a desperate position.

SOCIETY OF ARTS.—At the Society of Arts *Conversazione*, on Wednesday, the chief point of interest in the lecture-room centred on Mr. Seddon's beautiful illustrations of Eastern subjects, inclusive of many, extremely interesting, of Scriptural reference in Syria and Egypt, upon which an eloquent address was delivered by Mr. Ruskin. Among the variety of mechanical models on the ground-floor, those of the working size, exhibited by Mr. Lee Stevens, attracted general attention, particularly his regulating air-doors for marine, land, and locomotive furnaces, and smoke-preventing stoves. Of the latter, one was shown of the same size and shape as that in use at the Board of Health, manufactured by Hayward, Brothers, Blackfriars-road.

MEMS. OF MINES AND MINERS—No. II.

JAS. WARREN (St. Just), or "Great Jem," as he was commonly called, was a mining celebrity, and was one of those remarkable instruments the Almighty, in his inscrutable wisdom, uses to carry out his mysterious designs; a man of prodigious strength and size, addicted to the Cornish science of wrestling, by which he obtained an activity and coolness in danger so necessary under trying circumstances. In the year 1825, this man, with 39 other Cornish miners, was selected to proceed to Mexico, to work the silver mines in that country, and for that purpose left Falmouth in the *Cambria* schooner, whose only other freight was about 40 tons of quicksilver. In the Bay of Biscay, a vessel was discovered to be on fire; the captain of the brig *Cambria* (Codd), though it was blowing a heavy gale, bore down on the burning vessel, which proved to be the *Kent*, East Indiaman, with troops on board, amounting, with the passengers and ship's company, to nearly 640 souls. On nearing the ship, the crew of which, 80 in number, had mutinied, acting on the principle of "self preservation is the first law of nature," had seized the boats of the burning ship, and attempted to board the *Cambria*; on arriving, some of these sailors jumped on the deck, and being questioned as to whether all hands were in the boats, answered "No." James Warren, to his everlasting honour, be it recorded, insisted on their returning to the burning ship, to save as many as possible; on resistance being offered, he knocked down those who refused, assuring them there were 40 as good men as he on board, and that they would destroy every man who refused to do his duty; he made them row him back to the burning ship, threatening instant death to the men who should dispute his orders. He insisted none but women and children should be first rescued, and in this was successful, but on returning to the *Cambria* the difficulty was how to get the seasick, shivering wretches on board, none having more than their night clothes on. This noble fellow stationed himself in the fore chains of the *Cambria*, where his herculean strength became available, for he seized the first he could grasp, as the boat, with its living freight, rose on the boiling wave, and hurled them by main force on board the "ark of refuge." In this way he saved the lives of many individuals, and by his manly courage, noble bearing, and example inspired a confidence that, under God's providence in that fearful hour, "when shrieked the timid and stood still the brave," was the means of preserving upwards of 700 of these poor creatures, who from the dastardly conduct of the sailors (we trust for the sake of their country acting under the dread of a fearful death), had deserted their duty and left the helpless to their fate. In this great exertion this miner received such injuries as to prevent his again working at mining; but our Government gave him a minor situation in the Coast Guard, such as his education and abilities enabled him to take; the East India Company and the gratitude of the passengers made him such presents as would have rendered him independent, but improvidence, the usual companion of uneducated persons, neutralised all these efforts, and James Warren died in comparative poverty. This does not derogate from the goodness of his heart, or his readiness to face danger in time of necessity, when humanity dictated. I merely bring him forward as a type of his class, most of whom are actuated by the same feeling, though all are not given the physical power here so strongly developed and pourtrayed. He has been dead some years, but his name is still held in respect by the parishioners, as a good-natured, liberal fellow that "Great Jem Warren," the wrestler, in contradistinction to another James Warren, of the same parish, a noted wrestler, once the champion of the county, who was called "Little Jem Warren," or by sobriquet "Little Hercules;" this man was no more than 5 ft. 7½ in., yet his strength was prodigious, fully entitling him to his sobriquet; this man was also a miner, and worked at Levant and Boscaswell Downs Mines.

In this parish also resided a man whose daring gained him the nickname (all have them) of "Tom the Devil;" this man was one of the cliff pioneers, and would venture on paths a sheep or goat dare not attempt. Many of his feats of daring in rescuing shipwrecked mariners are almost beyond belief; as an instance of cool daring I may be allowed to enumerate the following:—In this parish are to be found a few of the now nearly extinct race of the Cornish chough, or red-legged crow, which build their nests in the most inaccessible places of the tremendous cliffs near Pendeen. A collector of ornithological specimens came into the neighbourhood, who was desirous of obtaining a few of these birds and their eggs. Tom was applied to, and at once accepted the task, by tying a rope around his body and being lowered to a depth of 100 ft. off the top, and about 200 ft. from the sea, and then swinging himself on to the ledge of the overhanging rock on which the birds are to be found; after alighting on this frightful precipice, Tom by some means let go the rope, which was then dangling 10 or 12 feet from him. As soon as he had collected the young birds and eggs, he shouted to those above to stand by and hold fast, as he was going to jump to the rope; the men at surface, as may easily be supposed, were horrified at finding no weight attached, and watched with dread Tom's experiment, when they saw poor Tom plunge headlong into the sea! on the surface of which he soon appeared, requesting them as loud as he could shout to go round to Pendeen Cove, as he would swim there as soon as they could walk; on their arrival, to their surprise they found Tom not only alive, but little exhausted, and nothing daunted by his tremendous leap and swim.

I mention these anecdotes to show the hardihood and presence of mind frequently displayed by our miners, many of whom, though clothed in rough exteriors, contain as many of the true nobilities of mankind as they who present more polished appearances. In my next I shall show some of the more accomplished miners, in whom mental powers will be shown as forcibly existing as physical. GEORGE HENWOOD.

ELECTRO-MAGNETISM AS A MOTIVE POWER.—In the discussion upon Mr. Hunt's paper on this subject (see last *Mining Journal*), it was remarked that Prof. Botto, of Turin, had estimated that with a Grove's battery there would be a consumption of 45 lbs. of zinc per horse-power per day. Starting with this, and assuming a battery of one cell, the equivalent of zinc being 32, and one-third of an equivalent of nitric acid being 18, there would be consumed for 45 lbs. of zinc, 25·3 lbs. of nitric acid equal to about 50·6 lbs. of commercial acid. Taking the zinc at 3d. per lb., and the nitric acid at 6d. per lb.; and setting off the small quantity of mercury used for the amalgamation, and the sulphuric acid against the salts formed, the estimated cost would be 1*l.* 16*s.* 10½*d.* per horse power for every 24 hours. Then came the theoretical difficulty of the equivalents of power; the difficulty not only of employing zinc, but also other materials—sulphuric acid, for instance, which was the cheapest; all these went through a costly process before they could be employed for those purposes—thus manufactured, and consequently expensive, materials were used, instead of crude matter. Therefore, unless the power could be utilised to a greater degree than in the steam-engine the difficulty was apparently insuperable. The forms of machines might be divided into three types—there was the principal of suspension, or making and stopping the magnetism, as employed in the machines of Dal Negro and Botto; the principle of "inversion of polarity" adopted by Richie, and followed by Jacobi; and the deflecting, or galvanometer principle, where the needle was deflected with a coil round it—this was first practised by Petrie. All the larger machines which had been constructed on the suspension or the inversion-principle—the latter being thought to be the best. A comparison which had been instituted as to the cost of different means of producing power showed, that for every shilling expended there might be raised by manual power 600,000 lbs., one foot high in a day; by horse-power, 3,600,000 lbs.; by steam power, 56,000,000 lbs.; by electro-magnetism, 900,000 lbs. The plan of winding round the magnet a closed coil of wire not connected with the battery, the induced current in which might be employed to produce magnetism in another bar of iron, had been tried by Hjorth, and had been abandoned, owing to the difficulty of dealing with the current when the magnet was in motion. It had also been found that the power of the second magnet thus created was of very inferior moment in any form of machine then devised, and was not practically available. With regard to the relation between heat and mechanical effect, the experiments of Joule had been confirmed by the researches of Prof. W. Thompson, of Glasgow; Dr. Scoresby worked with Joule on this problem; it had engaged the attention of Professor Bunsen, of Marburg, and more recently M. Favre, who had arrived at the same conclusions as those recorded by Joule. In closing the discussion, it was remarked that there could be no doubt, from what had been said, that the application of voltaic electricity, in whatever shape it might be developed, was entirely out of the question, commercially speaking. Without, however, considering the question in that point of view, the mechanical application seemed to involve almost insuperable difficulties. It might be suggested that the power necessary to destroy molecular attraction might not be comparable to the ordinary mode of developing power by imparting heat to elastic vapours, the one being an enormous force exerted over an infinitely small space, and the other a limited power exerted over a very large space. This view might derive illustration by considering the well known mechanical difficulty of comparing a given pressure at rest, and another pressure with a given velocity.

THE SEBASTOPOL FLEET.—The Boston (U.S.) Submarine Company have just despatched a vessel to the Black Sea with a numerous staff of mechanics and divers under the superintendence of Mr. Wellington Lee, who is considered one of the most experienced submarine engineers in the United States; an ample apparatus for blasting, and a Gwynne pumping-engine, capable of raising 1000 barrels of water per minute. As the submerged ships at Sebastopol (about 100 in number) were sunken under the direction of competent officers, with a view of being raised again, they have probably their hatches and ports closed, and are, therefore, precisely adapted to the new process. The old system of raising a sunken vessel was to use chains and scows, the chief objections being the damage done to the hulls by the friction of the chains and the uncertainty and expense of the process. By the new process the vessel is made so far water-tight as not to admit so much as 1000 barrels of water per minute, and then the pump is set to work, and creating a partial vacuum by exhausting the water, the vessel rises to the surface. It appears the process is secured by patent to the Boston Company.

Meetings of Mining Companies.

AUSTRALIAN MINING COMPANY.

A special general meeting of shareholders was held at the London Tavern, Bishopsgate, on Thursday, Mr. R. F. DAVIS in the chair.

Mr. WALFORD (the secretary) read the notice convening the meeting.

The report stated that at the annual general meeting, held in July last, the directors gave the shareholders to understand that as soon as the Charlton Mine had been tested to the extent of the funds which were at the directors' disposal, the board would call a meeting, to consult with them as to future proceedings. The despatches from Mr. Forster, the manager, extracts of which have already appeared in the *Mining Journal*, were taken as read, and the report concludes as follows:—

These and all other letters on mining matters have been regularly laid before your consulting mining agent, Captain Jehu Hitchins, who is in constant communication with the board, and whose report, dated April 20, 1857, upon the present position and future prospects of the mine, is as follows:—

Having carefully examined the reports of Mr. Forster of the workings at Charlton from time to time received, giving details of the progress of operations, I beg to observe, in the first place, that what has been done is in accordance with my advice and the instructions given by yourselves; consequently, so far they are such as I consider the most advantageous and proper to attain the object in view—viz., after ascertaining the nature of the stratification, the direction and prospects of the vein or veins met with in such explorations, to determine the best place to sink a shaft proper to carry on the deeper and more permanent operations.

These preliminary trials have occupied more time, and, consequently, greater costs have been incurred, than was at first supposed would be required. However, with but I think one exception, the course has been progressive with respect to the prospects; and his late letters of Jan. 20 and Feb. 2 of this year are, in my opinion, more satisfactory than any previous advices, as, after finding that the surface or shallow strata, containing nodules and stones of carbonate, and other rich ores of copper, such as the specimens sent home show, and the shaft No. 2, at a depth of 20 fms. below the surface—the deepest point yet reached—has met, in a cross-cut therefrom, the most regular lode yet found in the property. The great influx of water here is a good indication also, as showing a continuous vein has overmatched the horse-whim, so that without other more efficient power, it will, it is stated, be most difficult, if not impossible, to get deeper; and in this position of your adventure it is that you direct me to give my opinion for your own and the shareholders' consideration.

I think that, after having gone so far with the preliminary trials, with such kindly indications to begin upon, and resulting thus far so favourably, you should yet persevere to at least 40 fms. in depth in some one most likely point, the which appears to me to be the said No. 2 shaft, being the most central for driving cross-cuts; and to drive on the course of the lodes, veins, or branches, as the case may be, on their being cut through. The steam-engine now on the premises can be readily erected to work, which will pump the water cheaper and more efficiently than by any other means, having wood as fuel there.

Judging from the reports sent home, and forming my opinion also in part from having seen portions of the mining districts of Australia, both productive and more paying, the Burra Burra and Kapunda in particular, with the latter of which I think the Charlton Mine has some analogy, having strings and branches of green carbonates shallow, and a more compact lode in depth, I feel more satisfied in the recommendation to the shareholders to effect the trials I have named, as a general index result for this and other points of the property, which I hope will also hereafter command attention, there being indications in different parts of your land here nearly as promising and possibly as good at an equal depth. Although I cannot vouch for the correctness of the calculations to carry out the work to the extent I have advised, I think it can be well accomplished for what Mr. Forster has stated—3000*l.* additional, and which may be fixed as a limit.

Your past expenditure has been the more heavy on account of having to establish everything in a new part of the colony, and although the yet high price of labour will render the carrying on of the workings costly, yet with the observance of such economies as experience of the past will direct, together with the easy nature of the stratum for working, and the more direct circumscribed sphere of action, results can now be sooner arrived at, and also more cheaply than at first. Supplies also are better cared for—in fact, economics in every department better observed; and should the success I anticipated attend the search by meeting a good discovery of ore, the less carriage to shipping than from most of the other mines of the colony, and the good quality of the ore, will also be an item in the account.—JEHU HITCHINS.

TUNGKILLO.—This property, consisting of 20,000 acres, is now let on lease, for a period, of which five years were unexpired on Nov. 1, 1856; the rental derived from this property amounts to 815*l.* a year. Your directors have reason to believe that, within a limited period, or at most by the time of the expiration of the lease, the property will easily realise, if offered for sale, above 1*l.* per acre.

ALLEN'S CREEK.—347 acres of land were unsold here when the last advices left Australia; but negociations were pending for the sale of nearly half this quantity.

CHARLTON.—The point, however, which more immediately calls for the consideration of the shareholders, is the course to be decided on with regard to the Charlton Mine. It will be seen that Mr. Forster and Capt. Hitchins recommend perseverance; the latter especially urges that the shaft should be sunk to the 40, and both agree in estimating the cost at about 3000*l.* Considering the promising indications of the mine, were there funds in hand, the directors would not hesitate to counsel the adoption of the recommendations of so practical and prudent a miner as Capt. Hitchins. Still, in the present stringent state of the money market, and remembering the heavy burdens which have been borne by the shareholders of this company, and the serious disappointments which those who are interested in it have had to bear, the board naturally hesitate to ask their constituents to advance further funds by way of calls.

In viewing, however, one side of the question, the board must not lose sight of the other; and failing the proceeding with operations at Charlton it will become necessary to take steps towards realising the company's property; and it must not be forgotten that the same stringency of the money market which fetters you in following out the recommendations of practical men will operate disadvantageously should you attempt the realisation of your property at the present time. It may be well for the shareholders to consider the advisability, under existing circumstances, of adopting measures which will not necessitate a further advance of capital, and yet will test the Charlton Mine in the very fullest manner, and enable the company to dispose of their other property to the best advantage. If the shareholders should consider it desirable to attain these objects, the course to be taken, as it seems to the board, would be to raise amongst the shareholders and their friends, on loan notes, a sum of 5000*l.*, or thereabouts, for two years, at 7 per cent. per annum. The property of the company at Tungkillo alone, consisting of 20,000 acres of freehold land, exempt from royalty, and free from all incumbrances, affords an ample security for the money, and the interest named would give the shareholders advancing the money a return of a liberal character. It has been suggested by several shareholders that it would be desirable to make two separate calls, at certain intervals, not exceeding 2s. 6d. per share; but the directors, having given full consideration to the subject, are of opinion that it is not advisable to increase the paid-up capital of the company.

A statement of accounts was submitted, from which the subjoined is condensed:—

Cash at bankers, and money at call	£ 508	4	11		
Arrears of seventh call	95	0	0		
Allen's Creek, balance due	2020	4	6		
Copper ore on its way home	586	0	0 =	£3218	9 5
Loan notes	£ 750	0	0		
Colonial drafts	1600	0	0		
Sundries (say)	200	9	0 =	£2500	0 0
Balance in favour of adventurers				£ 718	9 5

The CHAIRMAN said, as the report went so fully into the position of affairs, he should only trouble them with a few remarks; but if any further information was required, he should have great pleasure in answering any questions. The board hoped to have called them together earlier, as from the indications they expected the mine by this time would be more fully developed. Mr. Forster found himself overpowered with water in the No. 2 shaft at 20 fms., which was always considered a good sign, and Capt. Jehu Hitchins was of opinion that they were coming to a continuous lode, which was generally the case when the water followed the lode. Mr. Forster had still a high opinion of Charlton Mine, which was confirmed by Capt. Kemfrey, who was still in the colony. Capt. Jehu Hitchins had seen the whole of the correspondence, and his discretion was generally known, although he might say more if he was not present. The question, now, was, whether they ought to give Charlton a further trial. He (the Chairman) was of opinion they ought to sink 20 fms. deeper; they had an engine of their own on the spot, and all they had got to do was to erect it. The estimated sum required, Mr. Forster was of opinion, would be about 3000*l.*, which was confirmed by Capt. Hitchins, and they had now to consider how they would raise that amount. He objected to calls, but still, after spending so much money, it seemed a pity to abandon the mine. If they disposed of the property at the present time they would be far more likely to lose than by carrying it on and testing it still further, as suggested by Mr. Forster and Capt. Hitchins. The plan that appeared to him most feasible for raising money was by loan notes, and that amongst themselves; such notes to be issued for two years, at 7 per cent. If the concern paid they could easily discharge the loan, and it might be convenient for some of the shareholders to advance this sum, instead of making a compulsory call.

Mr. JOHN FIELD approved of the plan, provided the directors were sure of getting the money, as in the present state of affairs here he was afraid they would be disappointed, unless they had a list of the shareholders on whom they could rely to come forward.

Mr. COXHEAD objected to any further experiments, as they ought to be satisfied with the testing as far as it had gone, and spend no more money. If they referred to the reports, they would find in the Charlton a parallel case to the Tungkillo Mines: 130,000*l.* had been already spent, and they might spend another 130,000*l.* He would submit whether they had not better wind-up, and divide something amongst themselves. Mr. Coxhead concluded by moving as an amendment that the company be wound-up, in conformity with clause 143 of the Deed of Settlement.

Mr. SMITH seconded the amendment.

A PROPRIETOR thought it very foolish to abandon the property after spending so much, and when all knew mining was so uncertain: they ought to make a further attempt to carry on the operations.

Mr. FIELD said, if the money could be obtained in the way proposed it would be preferable, but under any circumstances, however they might dislike mining, it would be a bad plan to pull up at the present time. (Hear.)

A PROPRIETOR, although altogether opposed to going on, strongly advised, in the event of doing so, to make a call rather than get into debt.

Mr. CYRUS LEGG considered they ought to carry on the mine a little further, but thought it morally impossible to raise the money by loan notes, and when Mr. Coxhead's amendment was disposed of he should propose a call of 5*s.*

Mr. LIVESEY said he had just returned from the colony, and was well acquainted with the property. The general opinion there was that it should have a further trial.

Capt. JEHU HITCHINS said he recommended the directors to make certain trials at the Tungkillo Mine; and those trials had been made, but not proving successful they were abandoned, and he was not quite sure they were carried far enough. (Hear.) He must refer them to the Burra Burra and the Kapunda, and the Charlton Mine was something like the latter, as they had strings of ore only at first, but on going down they met with the lode. (Hear.) He could only judge from appearances, but if they shut up the mine the loss was certain; if they went on they might meet with a very heavy prize. (Cheers.)

The CHAIRMAN, in reply to Mr. Field, said, although they had not got in their pockets the necessary promises, when they first came into office they were trusted with 13,000*l.* on loan notes, and they had no fear of the proprietors trusting them with 5000*l.* (Hear.) Whatever the proprietors wish we shall be happy to carry out: we came into the concern in the hour of trouble, and we will not abandon it in any difficulty. (Cheers.) He would remind them that if the amendment was carried it was virtually dissolving the company; for although the clause alluded to was to take into consideration the question, it would require, under the deed, three months before the two meetings could be held, during which time operations would have to be suspended in the colony, and at a heavy expense.

Mr. COXHEAD's amendment was then put, and declared lost.

Mr. CYRUS LEGG next proposed that the report of the directors be received and adopted, with the exception of the last two paragraphs, observing that it was only objecting to raising the capital by loan notes.

Mr. JONES seconded the amendment, which was carried.

Mr. LEGG said the next question was whether it was desirable to spend a further sum or not in testing the Charlton Mine or not: he was for proceeding. No one, in his opinion, could speak more favourably of the indications of the Charlton Mine than Capt Hitchins. He concluded by proposing that a call of 5*s.* per share be made, payable by two instalments of 2*s.* 6*d.* each, as required.

Mr. COXHEAD seconded the resolution, which, after a lengthened discussion, was carried; and a vote of thanks to the Chairman terminated the proceedings.

ALTEN MINING ASSOCIATION.

The special meeting of this association was held at the offices, 2, New Broad-street, on Tuesday, Mr. J. LABOUCHERE in the chair.

After the advertisement convening the meeting had been read, and the usual preliminary proceedings, the following report was read by Mr. WOODFALL (a director):—

In accordance with the views expressed by the directors in their last annual report, this special meeting has been called, for the purpose of submitting to the shareholders the present state of the affairs and property of the association, and to take such measures as may be resolved upon for increasing the capital of the company, which the directors consider may be best effected by an amalgamation with the Quænangen Mining Association. It is well known to those shareholders who for a long period have been interested in this association that the directors have laboured under great disadvantages, owing to the insufficient capital at their disposal for carrying on the affairs of the company: and during last year, when the produce of the mines diminished so materially, the directors felt that a time had arrived when a continuance of operations without additional means would be incurring a risk which the shareholders, as a body, must consider highly injudicious, and they now feel the necessity of calling on the shareholders to adopt such measures as may be deemed expedient for relieving the association from its present uncertain and critical position.

At the last annual meeting, the prospects of the mine had somewhat brightened, particularly at Raipas; and the directors are glad to state that this improvement has not only continued, but that a very material change for the better has also taken place at the Old Mine, where a continuation of the lode has been found under the former workings, a few fathoms distant from the place where the lode has been invariably intersected, and cut off by a slide. The last report states this discovery to be improving in depth, and the lode at that time was increasing in size, yielding 2½ tons of ore per fm. The discovery of the lode in this part of the mine is looked upon as of greater importance than anything met with in this district for many years; and should it continue to improve as it has done during the past two months, the chance of ultimately laying open an extent of lode of not less than 200 fms. in length appears probable.

For some time past operations have been carried on at Woodfall's Mine, for the purpose of exploring the south-west ground, where the prospects have been very encouraging, and where some fair tribute ground has been laid open.

At Michell's, a new adit has been driven on the course of a small lode from the side of the mountain, intersecting and draining the old workings on Nelien's lode, where it is hoped shortly to have some fair returns of ore. This adit has also been continued to Michell's old shaft, on the south lode, and a small extent of good orey ground has thereby been laid open, and is being worked on. It is considered advisable to continue this adit to the north-west, for the purpose of intersecting Michell's north lode, which formerly yielded large returns of rich yellow ore. There is seldom a summer passes without discoveries of greater or less importance being made, and a great number of promising lodes remain unexplored for want of means. The most recent discovery was made last autumn near the Kaafford Mines, on the Melsvig Mountains, close to some lodes that were worked some years ago. The ore at this place was good, and yielded profitable results, having been worked a short time only on tribute, but owing to the advanced state of the season, and earlier setting in of the winter than usual, operations were obliged to be suspended. It is intended to resume them this summer, and the appearance of the lode promises satisfactory returns. On the whole, the prospects of the mines have materially improved since the annual meeting.

The smelting establishment is in a perfect working condition, and fully equal to the reduction of more than double the present produce of the mines.

The financial position of the company, according to the last audited accounts, exhibits the following available assets:—At Alten, in cash, goods, stores, and materials, 9417*l.* 18*s.* 1*d.*; In England, 1249*l.* 14*s.* 4*d.*=10,667*l.* 12*s.* 5*d.* This latter sum is all that remained for the directors to provide for the supplies of goods and materials, and other expenditure, for at least 18 months before receiving any further remittances in copper from Alten, consequently the shareholders must clearly see that the directors are obliged to have recourse to their bankers for considerable advances to prosecute the mines. The directors wish to see this unsatisfactory state of affairs remedied as soon as practicable. With this view, they have considered the most feasible plan for effecting the object would be by an amalgamation with the Quænangen Mining Association, and to carry on the joint establishments as one company, constituted under the Limited Liability Act. The plan they propose is as follows:—

1. That the nominal capital of the joint concern shall be 50,000*l.*, in 10,000 shares of 5*l.* each.

2. That the 5000 existing Alten shares shall be deemed paid up to the extent of 7*l.* 10*s.* per share, leaving the liability the same as at present—viz., 10*s.* per share, 2500*l.*

3. Of the 3000 shares constituting the Quænangen Company 400 are and shall be considered fully paid up, and 2600 shares shall be liable to a call of 2*l.* per share, making additional capital, 5200*l.*

4. That the directors shall have power to issue 2000 additional shares of 5*l.* each at such time as they may consider desirable, 10,000*l.*, which will give an additional capital of 17,700*l.* to the company.

5. That the company be constituted under the Joint-Stock Companies Act, 1856, with limited liability.

The directors believe that if this plan be adopted, the amalgamated company thus constituted will be able to continue operations with good chances of successful results.

The CHAIRMAN stated, in moving the adoption of the report, that the late war had materially affected the results of the working of the mines during the past few years, inasmuch as the greatly increased cost of materials and goods had not only left no chance of profit, but had encroached on the resources of the company to such an extent, that the directors felt they could no longer carry on the concern without considerable additional means. In order to enable them to provide funds for sending out the necessary supplies, which have to be paid for twelve months at least prior to the receipt of the copper, they, therefore, propose the amalgamation with the Quænangen Association, as that company was now working profitably, and had capital uncalled. With regard to the Alten Company the facts were this, they had carried on the operations for a long series of years, but not without being invariably under very great obligations to their bankers, and it was this unsatisfactory state of things they desired to remedy. The prospects of the mines had of late considerably improved, and the manager now reports that they are yielding a profitable result. Their bankers might be willing to give them advances as old customers, but what he desired was to see the company entirely independent of them. Mr. Thomas, their late local manager, was present: he had left their service; he was quite ready to give them any information they might require. There was a fair prospect of their doing well, and he thought the best course the shareholders could adopt was that of following out the recommendations of the directors.

Mr. EDWARDS enquired whether they had any royalty to pay?

Mr. WOODFALL said there was formerly a seigniorage of 10 per cent., but this had been remitted by the Government, and he could confidently say would never be reimposed. They had received immunities for a further period of ten years.

Mr. BIRDSEY said he wished to know what was the fair valuation of the property; much had been expended at Alten, and in his opinion they ought to pause before they consented to amalgamate the property with the Quænangen, which, as he understood, was an entirely new concern.

Mr. THOMAS observed, that although a large amount had been spent on the Alten Works, and that the plant and works were perfect, yet, that if they were sold, they would not realise a fifth of their value.

Mr. WOODFALL said the Quænangen property afforded them ores, in his opinion the amalgamation of the two companies would be beneficial to both.

Mr. DE GRAVE was of opinion that previous to their amalgamating with the Quænangen Company, they should endeavour to dispose of their property to parties in Hamburg or elsewhere. He was the auditor of the company, and had been a shareholder from the commencement, and he thought that a committee of Alten shareholders should be appointed to determine whether the propositions of the Quænangen proprietors should be adopted or negatived.

A desultory discussion then ensued as to the propriety of the steps to be adopted, when it was ultimately resolved that the directors should be empowered to carry out the proposed amalgamation.

The CHAIRMAN stated that Mr. Thomas, their late manager, was present, and he did not think they should separate without giving him a vote of thanks for his efficient superintendence at Alten, and his general good conduct in their service. This was put and carried with acclamation.

Mr. THOMAS observed, in returning thanks, that he should not have been able so well to fulfil his duty in a climate where there were so many difficulties to contend with, had it not been for the encouragement which he had received from London. He should always feel grateful to the directors, secretary, and the shareholders, for the support they had afforded him.

A vote of thanks was then given to the Chairman and directors, and the meeting separated.

QUÆNANGEN MINING ASSOCIATION.

An ordinary general meeting of shareholders was held on Tuesday at the offices, 2, New Broad-street,—Mr. JOHN LABOUCHERE in the chair.

After the secretary (Mr. E. J. COLE) had read the advertisement from the *Mining Journal* convening the meeting, the following report was read:—

The directors have much pleasure in meeting the shareholders on this occasion, inasmuch as they are able to inform them that after several years' preparatory work they have now brought the mines into that state which promises henceforward to yield profitable results. In driving the deep adit a small course of ore was intersected, which on being further explored was found to improve in depth. In the 10 the size of the lode became, and is still, not only larger, but more productive, and the prospects continue highly flattering. The quality of the mineral from this place is also very good, averaging about 10 per cent. A shallow adit level is being driven on the course of the lode E, in an easterly direction, for the purpose of exploring it, and also in the expectation of intersecting lode D, which formerly yielded large returns of rich purple and grey ores. The great object which the directors have had in view has been the gradual development of the resources of the mines in such manner as to secure their permanency. From the hard nature of the ground it necessarily requires a longer time to explore and lay open the lode than is generally the case with mines worked under more favourable circumstances. By the last advices received the directors fully expect to return the whole of the year's produce to the end of March last, estimated to yield about 30 tons of copper, and from the appearances of the lode they anticipate the produce of the present year will amount to about 36 tons of copper, without incurring any extra expense, and as soon as the workings in the 10 are sufficiently advanced operations will be commenced for further exploring this discovery in the 20, where, should it prove so good as it now promises to be in the bottom of the 10, still greater and more profitable returns may be looked for. It must be known to the shareholders that the ores from this establishment are carried to the Alten Copper Works, and there smelted on advantageous terms, thus avoiding the necessity of erecting a separate smelting establishment at Quænangen, which would be attended not only with very great expense, but also with many difficulties, arising from the want of the varieties of copper ores for smelting successfully.

Although the annual expenditure at this place is comparatively easy, the directors are of opinion that a great advantage may be derived from an amalgamation, if possible, with the Alten Copper Works, where there is a very perfect establishment for all the purposes of mining and smelting; and, after considering the circumstances under which the company is situated, the directors are decidedly of opinion that it is desirable to form an amalgamation with that association.

The balance against the mine being 5173*l.* 6*s.* 5*d.* has mainly arisen from the driving of the adit level, and in clearing out the old workings, which occupied nearly six years to accomplish, and yielded no returns. Further, in the last two years the expenses have been increased by upwards of 1000*l.*, owing to the high prices paid for coals, materials, and goods during the war in the East. To meet this deficiency the directors propose to issue, at the most favourable opportunity, the unallotted shares, and to make a call, or calls, on the shareholders for the balance. The proposition the directors recommend is, that the 3000 shares of this company be amalgamated with the shares of the Alten Mining Association, on such terms as the directors may find most desirable for the interests of the shareholders.

Mr. THOMAS observed that the mines were in a good condition, and likely to be more productive as their capabilities were further developed.

Mr. HARRISON said that he thought the best course they could adopt would be to follow out the recommendation of the directors. Their ores were now smelted at the Alten works; there they had reduction establishments, which at Quænangen they did not possess, and, in his opinion, the amalgamation would be beneficial to both parties.

The CHAIRMAN said, as the chairman of both companies, and possessing some interest in both, after an anxious consideration this was the most practicable result they could arrive at. At present their ores were smelted at Alten, at a profit to both parties, and if sent in a raw state to Swansea a greater expense would be incurred.

It was moved by the CHAIRMAN, and seconded by Mr. HARRISON, that the report of the directors should be adopted, and they should be empowered to carry out the amalgamation proposed therein.

A SHAREHOLDER enquired what was their present produce?

Mr. THOMAS said that last year it had been about 30 tons of fine copper; this year it was calculated the produce would be 36 tons.

The CHAIRMAN enquired whether the prospects were improving?

Mr. THOMAS said they were now driving a level easterly for exploring lode E, and also in the hope of intersecting lode D, which had been one of the richest lodes at this place. The recent discovery in the 10 fm. level was highly encouraging, and when further developed he had no hesitation in saying that the returns would correspondingly increase. He was enabled to speak thus confidently, on account of the present favourable appearance of lode E.

A discussion then ensued as to the terms of the amalgamation, which eventually resulted in the proposition of the directors being entirely carried. A vote of thanks was passed to the Chairman and directors, and the meeting separated.

OOLA MINING COMPANY.

A general meeting of shareholders was held at the offices, Cannon House, Queen-street, on Wednesday, Mr. CHARLES SMITH in the chair.

After the usual preliminary proceedings, Mr. ALFRED JEFFREE (the secretary) read the following reports from Capts. Pascoe and Crase:—

May 4.—According to your request, I have this day visited the Oola Mines, and have to report on the present prospects of the mine; also the work done for the last four months. There have been three cot-houses, a counting-house, and storerooms built; also a room for horse and spare materials will be completed in three weeks from this time. The counting-house is now complete, with the exception of painting. The mason work for machinery has been finished for the last three weeks, as far as instructions. Masons are now building a smith's shop, which will be finished in about three or four days. The prospects, as I have often said, are good. You have six separate lodes running in space of 60 fms. There has been but little done underground to report on. The water is now out of the engine-shaft, and the men will at once commence cutting down the end of the shaft, and prepare for plunger-lift. The engine and lift, and a horse and cart, are also wanted.—JOHN PASCOE.

May 4.—We have built account-house, three cottages, storehouse, and stable for a horse. The account-house is finished, except painting. The cottages will be finished in three weeks. We have finished the bob-pit and the walls around the shaft; also the walls that carry the machinery, so far as we have had instructions. We are building a smith's shop, which will be finished in three or four days. In cutting back a piece of ground in the side of the hill, in order to get stone for building, we discovered two small lodes or branches, from 6 to 9 in. wide, composed of gossan and spar, with rich spots of lead ore mixed throughout the branches. Within 60 fms. we have discovered six lodes, three of them large champion lodes. We shall commence immediately to cut down the western end of the engine-shaft, in order to fix the plunger-lift. Very shortly after the engine goes to work, we shall be able to send lead and copper ores to market.—CHARLES CRASE.

The CHAIRMAN observed, they had the reports now before them, and he should be happy to hear the opinion of any gentleman. He could assure them that the committee would be happy to afford all information to the shareholders.

Mr. ELAND enquired what buildings they had at present on the mine?

Mr. CHANDLER said, there were several cottages, and in the course of a few weeks the engine-house would be erected. So soon as that was done, and the engine put up, they could expect to make returns.

The following accounts for the five months ending April were then submitted:—

Mine cost and merchants' bills	£388	8	4		
Law charges, printing, secretary's salary, &c.	110	10	4		
Balance of purchase of engine and crusher	400	0	0		
Engineer's fees and travelling expenses	15	15	0 =	£914	13 8
[illegible] adit	14	16	8		
Calls received	458	2	6		
Copper ore sold	4	7	3 =	477	6 5
Balance against mine				£437	7 3

The balance of liabilities over assets was 455*l.* 7*s.* 3*d.*—The accounts were adopted after a short discussion.

Mr. JEFFREE said that, very shortly after the engine was put up, they would begin to raise some quantity of ore. They could not expect much before they came down to the 30 fm. level. They had six lodes to work upon; and whenever a junction was made, they could expect to make good returns, as, according to all indications, and judging from the geological features of the district, when that was effected, they must come on a rich course of ore.

Mr. ELAND thought the shareholders had experienced some unnecessary delay, in consequence of the engine not being erected. Had that been up before, probably by this time they would have made returns of ores.

Mr. GLANVILLE said, he could not be answerable for the erection of the buildings. The wet weather had much retarded the masonry work. So soon as the buildings were in a fit state to receive it, the engine would be erected.

Mr. WILSON thought they ought to provide for the ensuing three months. He should, therefore, propose that a call of 4*s.* per share be made.—After some discussion, this was agreed to.

Messrs. Charles Smith, Richard Glanville, R. S. Palmer, Thomas Chandler, and Alfred Goslett, were elected the committee of management.—A vote of thanks was given to the Chairman and directors, and the meeting separated.

EAST WHEAL RUSSELL MINING COMPANY.

The quarterly general meeting was held at Mr. Murchison's offices, Bishopsgate-street, on Thursday, Mr. JOSEPH PROCTER in the chair.

Mr. MURCHISON read the notice convening the meeting, and the minutes of the last, which were confirmed.—The following report from Capt. Goldsworthy was read:—

May 5.—Since the last general meeting the 66 has been extended east of the ore ground discovered in the level above, between 7 and 8 fms., and with the exception of a few fms. of tin ground, nothing of value has been discovered, this I attributed to the drivage in this (the 66) level having been on the south part of the lode, whereas, in the 55, the north part of the lode was carried, and which I have proved by putting out a cross-cut and intersecting another part of the lode, which I am happy to inform you, so far as seen, is of a very kindly description—2½ ft. wide, and producing good specimens of grey and yellow copper ore; sufficient work, however, has not been done in this direction to enable me to speak with more accuracy of its value, but it may be regarded as a very important improvement. About 20*l.* worth of tinstuff has been added to that already on the floors, making altogether about 150*l.* worth of that mineral obtained without stoping any of the backs, which stand for 10 fms. in length, and to prove how high it holds up I intend putting two men there next week, when, if it be found worth while to do so, a small set of stamps can be attached to the present drawing machine to enable us to make it marketable. A tribute pitch is being worked at 13*s.* 4*d.* in 1*l.* in the back of the 88, but the ore does not appear to be holding up. In the north part of the sett there is a lode on which a great deal of shallow work has been done; an adit level has also been driven on its course for a considerable distance, and in places, where I have seen it, it is from 4 to 5 ft. wide, carrying two good walls, well defined, and composed of gossan, mundic, quartz, and a good capel, and I have observed some good stones of ore on the burrows. This lode is of a promising character, and, in my opinion, warrants the attention of the company, and I should recommend the adit level to be cleared with all speed, which could be done for 50*l.* or 60*l.*, and would better enable us to judge of its character and to decide on the best mode to be adopted for its development.

P.S. Thirty tons of copper ore were sampled on Friday last, which, by Mr. Harvey's assay, yields 4½, and is worth, say, 130*l.*

A statement of accounts was submitted, from which the subjoined is condensed:—

Balance last meeting	£171	10	9		
Calls received	450	7	6		
Ore sold	190	8	7 =	£812	6 10
Labour cost (including arrears)	211	2	8		
Merchants' bills	521	11	11		
Office expenses	34	3	7		
Discount	2	7	5 =	769	5 7
Balance in favour of adventurers				£43	1 3

Mr. MURCHISON, in answer to a question, said it was expected to take three or four days to cut through the lode.

The CHAIRMAN said, as the report recommended clearing up the adit, which would only cost about 50*l.*, the question was, whether they had better not make a call sufficient to thoroughly test the matter.

Mr. BAYLY remarked that they had a very careful agent, and it would rest whether they should make a call of 1*s.* or 1*s.* 6*d.*

The report and accounts were adopted, and a call of 2*s.* unanimously agreed to, as that would cover every liability, in addition to the 50*l.* for clearing the adit.

Mr. BAYLY suggested that a special resolution had better be passed respecting the adit.—It was then proposed that the recommendation of the captain to clear the adit on the north lode be adopted.—Carried unanimously.

Mr. COOKE said, Mr. Powell intended to retire from the committee of management, and he was of opinion that they had better fill up the vacancies to five, the number in their rules, as there would be only two left.

Mr. MURCHISON said that, according to the rules, they could not elect a committee, unless at a special general meeting.

Mr. BAYLY observed that the difficulty could be got over at the next general meeting, by adding to the notice that it would be made special for the election of a committee of management. He must remark that he never attended a meeting where the affairs were looking more promising.—The proceedings then terminated.

NORTH BRITISH AUSTRALASIAN COMPANY.—A deputation of the Scottish Australian Investment Company have waited upon the directors of the North British Australasian Company, and met the committee of investigation recently appointed, with a view of confirming the terms with the Bon Accord Company, but the committee declined to accede to any arrangement until after issuing their report.

WEST OF IRELAND MINING COMPANY (LIMITED).

Under Act 19 and 20 Vic., c. 47.

Capital £50,000, in 50,000 shares of £1 each,
5s. thereof to be paid on application for shares, and the balance of 15s. at the expiration of two months from the date of allotment.

The capital to be increased, as the works progress, by subsequent serial issues of shares. The holders of the first issue to have the right of pre-emption of the shares to be afterwards issued.

DIRECTORS.

Lord GEORGE HILL, Ballyare, Ramelton, & Gweedore, Dunfanaghy, Co. Donegal.
Colonel Sir JAMES STEWART, Bart., Vice-Lieutenant, Co. Donegal, Fort Stewart, Ramelton.
Sir GEORGE EDMUND HODGKINSON, 150, Leadenhall-street, London.
JOHN ALEXANDER, Esq., M.P., Carlton Club, and Milford, Co. Carlow.
WILLIAM DARGAN, Esq., 74, Harcourt-street, Dublin.
JOHN KNOWLES, Esq., Piccadilly, Manchester.
WILLIAM PROSSER, Esq., Northfield Villa, Wandsworth.
J. BISHOP CULPEPER, Esq., 26, Gloucester-terrace, Hyde-park, London.
(With power to add to their number.)

CONSULTING ENGINEER.

John Petherick, Esq., Bonmahon Cottage, Waterford.

SUPERINTENDENT OF WORKS.

John Hamilton Clement, Esq., F.C.S., Civil and Mining Engineer.

RESIDENT ACCOUNTANT.—J. Richard Owen, Esq.

SOLICITORS.

London—Messrs. Hancock and Sharp, Tokenhouse-yard.
Dublin—Sir Matthew Barrington, Son, and Jeffers, 10, Ely-place.

AUDITORS.

Henry George Hadley, Esq., 8, Old Jewry, and 24, Blandford-square, London.
Stephen Neal, Esq., 16, Parliament-street, London.

BANKERS.

London—Messrs. Currie and Co., Cornhill.
Dublin—Provincial Bank of Ireland, 61, William-street.

BROKERS.

London—John Metcalfe, Esq., Stock Exchange, and 4, Clement's-lane.
Dublin—Messrs. J. J. Stephens and Sons, Dame-street.
Liverpool—Messrs. H. Davies and Co., Royal Bank-buildings.

SECRETARY—J. Burns Bryson, Esq.

OFFICES,—1, CHARLOTTE ROW, MANSION HOUSE, LONDON, E.C.

PROSPECTUS.

The object of this company is the general development of one of the richest and most varied mineral deposits in the British Islands.

The lease, granted by the Marquis of Sligo to Sir James Dombrain, for a term of 41 years, at a royalty of 1-16th, will be held by this company on very favourable terms. The area comprised in the grant is not less than 150,000 acres (more than 200 square miles), and embraces all mines and minerals.

The lands are situated in the western and south-western districts of the county Mayo. The map and section contained in the report of Mr. Doyle, and the reports of Messrs. Francis, Brett, and Colles, define their position and geological strata. Lough Mask is within the area, and the whole is intersected with rivers and streams, so that the water power is inexhaustible, while the sea frontage affords every opportunity for shipment, either by the formation of quays to suit circumstances, or by means of the existing and well-known ports of Killeries and Westport.

That the western coast of Ireland abounds in every description of mineral yield is beyond controversy; but hitherto there has been but limited exploration of its riches. Coal, iron, copper, lead, silver, marble, and slate exist throughout. The iron is equal in quality to the blackband of Lanarkshire, and its marbles, of every colour, are almost without rival. The cubic lead ore even of this locality contains more silver per ton than is to be found in lead ore of this crystalline form in any other country. The value of the grant is therefore apparent; and nothing but capital and enterprise are required to develope its enormous wealth, which, while proving highly remunerative to the shareholders, must necessarily be of great importance, not only to the district, but to Ireland generally, and in the mineral and general commercial markets of Great Britain.

The geological position and indications of this extraordinary tract of country are so clearly defined in the reports, that it is sufficient to refer to them. Although the description by Mr. Doyle, and those of Mr. Francis, Mr. Brett, and Mr. Colles, are so satisfactory, yet it must be borne in mind that their observations have been limited to a small portion only of this vast estate, there being many thousand acres presenting extraordinary features in a geological and mineralogical point of view which have never yet been explored.

The position of this property as respects exports, especially to America and Canada, is a point of great consideration. It is well known that the supply of slate from Wales and Cornwall is not equal to the demand, and vessels are constantly returning to the United States without the desired cargo. In Wales orders cannot be executed under three years at the principal quarries, yet 350,000 tons are quarried annually there alone. This company may monopolise the American trade in this article, and supply all that is required. America will also open a field for a continuous demand for marbles of every description for use and ornament. Nothing but ready transit by railway prevents the ports on the west coast of Ireland becoming rivals of Liverpool in the trade of the United States; and as Ireland is rapidly extending her railroads in that direction, a very important change in the general prosperity of its western districts will be speedily produced.

Altogether this mineral estate presents many varied and important features for profitable development, that it has been determined to commence operations forthwith: the capital at present proposed being fixed at a sum calculated to enable the company at once to prosecute such works as will fairly test the advantageous results confidently anticipated, and being intended to be increased by the issue of new shares as the progress of the works may demand. It will be observed from the reports, that lead, marble, and slate can be operated upon at once, at an outlay which justifies the expectation of large and increasing dividends from these sources alone, apart from the other valuable metals and minerals in the lands.

The Act of Parliament under which this company is incorporated limits the liability of each shareholder to the amount of the shares held, thus giving to mining enterprise that security to which it is so justly entitled.

The position which British mining takes in the general commerce of the country, is clearly demonstrated by the statistical returns, published monthly by the Board of Trade, of the exports of home produce and manufacture. In last year, ending Dec. 31, 1856, it appears that the total exports of the United Kingdom amounted to £115,890,857, and of this no less than £27,151,880—a little less than one-fourth—represents metals and metallic manufactures, the produce consequently of our mines. The increase of the total exports during the year 1856, over the previous year, 1855, is £20,202,772, of which £6,149 320 is in the export of metals. Ireland has already begun to contribute considerably to this state of prosperity; and it is undoubted that a judicious employment of skill and capital will develope resources in that country, and more particularly in the district above described, as great, if not greater, than those contained in any other portion of the empire.

Prospectuses, the reports above referred to, and forms of application for shares may be had at the offices, or from the solicitors and brokers of the company. 151

THE CASTLETOWN COPPER MINING COMPANY, IRELAND (LIMITED).

Capital £31,000, in 21,000 shares of £1 each.

Shareholders only liable for the amount of their subscription, and subject to no future calls.

DIRECTORS.

JAMES JOHN CUMMINS, Esq., Wilde Croft, Buckland, Surrey.
THOMAS GILL, Esq., Plymouth.
J. B. ELIN, Esq., 8, Ulster-terrace, Regent's-park.
J. STEDMAN, Jun., Esq., Bath.
Capt. WM. ABDY FELLOWES, R.N.
A. N. COLE, Esq., 14, St. James's-square.
C. BOURDILLON, Esq., 14, Throgmorton-street.
(With power to add to their number.)

BANKERS—Messrs. Glyn, Mills, and Co., London; Provincial Bank of Ireland, at Skibbereen.

SOLICITORS—Messrs. Coode, Kingdon, and Cotton, 10, King's Arms-yard, Moorgate-street.

BROKER—Charles Bourdillon, 14, Throgmorton-street.

SECRETARY—George Lloyd Williams, Esq.

OFFICES,—82, MARK LANE, LONDON, E.C.

The mines of this company are situated four miles to the south of Skibbereen, in the barony of West Carbery, in the county of Cork, a district which has, for many years, been famous for the production of copper ore, and which, from further recent valuable discoveries, is again beginning to attract the serious attention of capitalists and miners.

A good road leads from the mines to Castletownsend, where every facility exists for shipping ores at all seasons of the year.

The sett, which extends under 1800 acres, in a country of the most favourable geological formation for producing copper ore, contains two distinct mines, at a distance of half a mile apart. These were originally opened about 18 years ago by a small private company of gentlemen, resident in London, who left the entire conduct of the operations to their local manager. They were not, however, more fortunate than many others engaged in similar undertakings in that locality in avoiding the gross extravagance and mismanagement which at that time seemed to be the rule; rendering success impossible; and after a short working, and the expenditure of several thousands of pounds, they abandoned them at the very time when economy and judicious management would have rendered them highly profitable.

The whole of the adits, shafts, and levels in the northmost of the mines have been lately cleared up, and a great extent of ore ground laid open; whilst, at the same time, about 1500 tons of excellent orestuff have been brought to surface.

The mines have been carefully surveyed by Mr. Matthew Francis, whose minute report, which is beyond the limits of this advertisement, may be had, with the prospectus, at the company's office; or will be forwarded, free, on application. But the following extracts from it will suffice to show the present condition of these mines, and the flattering prospects which they hold out:—

"The lode in the northmost mine is almost perpendicular, its underlie being only 2 in. in a fathom to the north. This lode has been opened for a depth of 29 fms., or 20 fms. under the adit. It is about 12 ft. wide, on an average, and is composed of a beautiful grey oxide of copper, yielding 27 per cent. when cleaned, a very fine description of spar, and a thick wall of elvan, or indurated rock, on the south side, or footwall. I should recommend that this ore be assayed for silver, which, from the appearance of the killas, I believe it holds in some considerable quantity. The length of ore ground yet opened is about 100 fms., which appears to increase in value in the lower parts of the mine. The men were blasting down some very rich ore in the 20, or lowest level, when I was underground.

I calculate that, if a steam-engine were erected for drawing and crushing, 100 fms. of ground might be easily taken away per month in the present state of the mine, which would give a profit of 600*l*. My opinion is that this rate of profit may be relied upon for a very long period.

In the first place, there must be a steam-engine erected, and this is the most important object to be speedily obtained; and as the ends of the mine are still in ore ground, which may continue, and increase the length and produce of the mine to an unknown extent, I should say it would be judicious to erect an engine capable of doing twice the work.

The grant contains three other known lodes, to the south of the principal mine the second of which, in that direction, I found opened by an adit level, in a rise, from which I saw an excellent course of grey copper ore, accompanied by spar and the greens of copper, worth from £10 to £12 per fm.; and as this ore is in a rise, and extends into the whole ground that forms the end of it, both to the east and west, I cannot conceive the reason for which the working was suspended, as it would give good profit. I would add that there is water-power to work this mine which would be available for a considerable depth.

In concluding this notice of your mines, I would again advise you to erect the steam-engine at once, without going to further expense in breaking ore. The returns from the ore already at grass will enable you to carry on all your necessary mining operations, and to divide a good surplus in profits. All necessary substantial buildings, shops, &c., are erected, and convenient upper dressing-flooring constructed for carrying on immediate operations on a large scale; while all future buildings can be economically constructed, as stone and slate exist in abundance upon the property, and everything underground and at surface evidence to me that the present management is in able and judicious hands."

This opinion, so far as extends to the very rich quality of the ore ground, and the paramount necessity of crushing and cleaning it, is strongly supported by a letter from the agents at Swansea, to whom a small experimental cargo was consigned, and which may be had, together with the report.

Within the last few days the following gratifying and important advice has been received from the manager of the mines:—

"Since I wrote you last, I have, with pleasure, to inform you we have discovered a most splendid looking lode in getting out the foundation of the boiler-house. It is about 15 fms. to the south of the great lode and whim-shaft; a very fine gossan, spar, and prian, with some black oxide of copper, carbonate of lime, &c.; I believe it is over 6 ft. wide, and the strata about the lode is of the finest character of killas and porphyry."

As the new lode can, of course, be worked be the machinery now in the course of erection, it is needless to dwell upon the additional value which this discovery imparts to the north mine since the date of Mr. Francis's report.

The mines have been purchased by this company, and 8000 shares are reserved for the purchase-money and contingent expenses. The ore at surface will be taken at Mr. Francis's valuation of £1500; one-half to be paid at once, and the remaining half as soon as the mine declares a dividend.

A fresh lease for 21 years, at the moderate royalty of 1-18th, has been secured, and negotiations have been opened with the proprietor of adjoining lands for an extension of the company's rights. The requisite machinery has also been ordered, and is now in a forward state.

It is now proposed to raise £6000 of the remaining capital to provide the engine and crusher, and to work the mines as recommended by Mr. Francis.

Of this amount, upwards of 1000 shares have been applied for and paid upon.

Persons desirous of taking the remaining shares are requested to pay the amount they require to the credit of the company, with Messrs. Glyn, Mills, and Co., the bankers of the company, on the production of whose receipt the shares will be allotted in the order of priority of application. The bankers are instructed to decline further receipts as soon as 5000 shares have been paid upon.

N.B.—By this arrangement all formal applications for shares, and consequent letters of allotment, will be dispensed with.

Of the 7000 shares remaining unissued, 3000 are liable to be called at par within 12 months, by those directors who have rendered themselves liable for the engine, &c.; the remaining 4000 will be offered to the holders proportionably, in case an extension of work should hereafter be found desirable.

The directors refrain from stating what they believe may be fairly calculated upon as a return for the outlay proposed; but the large quantity of ore at grass, the condition and capability of the mines, as vouched by Mr. Francis, and the fact that they can be efficiently worked at a moderate cost, lead them to entertain no doubt but that a handsome dividend will be realised within three months after the engine and crusher are erected. 154

A plan of the mine, and specimens of the ore, may be seen at the company's offices.

PRIZE SUBJECTS FOR SESSION 1857-58.

THE ROYAL SCOTTISH SOCIETY OF ARTS proposes to AWARD PRIZES of different values, of Thirty Sovereigns and under, in Gold or Silver Medals, Silver Plate, or Money, for APPROVED COMMUNICATIONS, primarily submitted to the Society, relative to INVENTIONS, DISCOVERIES, and IMPROVEMENTS in the MECHANICAL and CHEMICAL ARTS in general, and in their relation to the FINE ARTS, and also to means by which the NATURAL PRODUCTIONS of the country may be made more available; and, in particular, to such as—but not limited to—the following, viz.:—

I. INVENTIONS, DISCOVERIES, or IMPROVEMENTS in the USEFUL ARTS.
II. EXPERIMENTS applicable to the USEFUL ARTS.
III. COMMUNICATIONS of PROCESSES in the USEFUL ARTS practised in this or other countries, but not generally known.
IV. PRACTICAL DETAILS of PUBLIC or OTHER UNDERTAKINGS of NATIONAL IMPORTANCE, already executed, but not previously published; or valuable suggestions for orginating such undertakings.

KEITH PRIZE (value Thirty Sovereigns).—For some important "Invention, Improvement, or Discovery in the Useful Arts," which shall be primarily submitted to the society during the session.

REID AND AULD PRIZES.—For the First, Second, and Third best Models of "Anything New in the Art of Clock or Watch Making, by Journeymen or Master Watch or Clock Makers:" if these shall be considered worthy of prizes, the year's interest of the Reid and Auld Bequest, being about Seven Guineas, divided among them in such proportions as the Prize Committee shall fix, according to merit. To such as may deserve it, the society may add to the amount of the prize out of its general funds.

GENERAL OBSERVATIONS AND DIRECTIONS FOR PREPARING AND LODGING COMMUNICATIONS.

Communications intended to compete for prizes shall not have been patented, nor have been previously published, nor read before any other society. Patented articles may, however, be exhibited and described.

The descriptions of the various inventions, &c., must be full and distinct; be legibly written on foolscap paper, leaving margins at least 1½ in. broad, on both sides of each page, so as to allow of their being bound up in volumes; and, when necessary, be accompanied by specimens, drawings, or models. All drawings to be on imperial drawing paper, unless a larger sheet be requisite. The drawings to be in bold lines, not less than a quarter of an inch thick, or strongly coloured, so as to be easily seen at about the distance of 30 ft. when hung up in the Hall, and the letters or figures of reference to be at least 1½ in. long. When necessary, smaller and more minutely detailed drawings should accompany the larger ones, for the use of the committees, having the same letters or figures of reference.

The society shall be at liberty to publish in their *Transactions* copies or abstracts of all papers submitted to them. All models, drawings, &c., for which prizes shall be given, to be held to be the property of the society; the value of the model, &c., being separately allowed for.

Communications, models, &c., are to be addressed to the secretary, 55, Great King-street, Edinburgh, postage or carriage paid; and they are expected to be lodged on or before the 1st November, 1857, in order to ensure their being read and reported on during the session (the ordinary meetings of which commence in November, 1857, and end in April, 1858), but those which cannot be lodged earlier will be received up to the 1st April, 1858; those lodged after that date may not be read or reported on till the following session. For a detailed list of suggested prize subjects, application may be made to the secretary.

By order of the Society,
JAMES TOD, Sec.

Edinburgh, April 13, 1857. 155

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